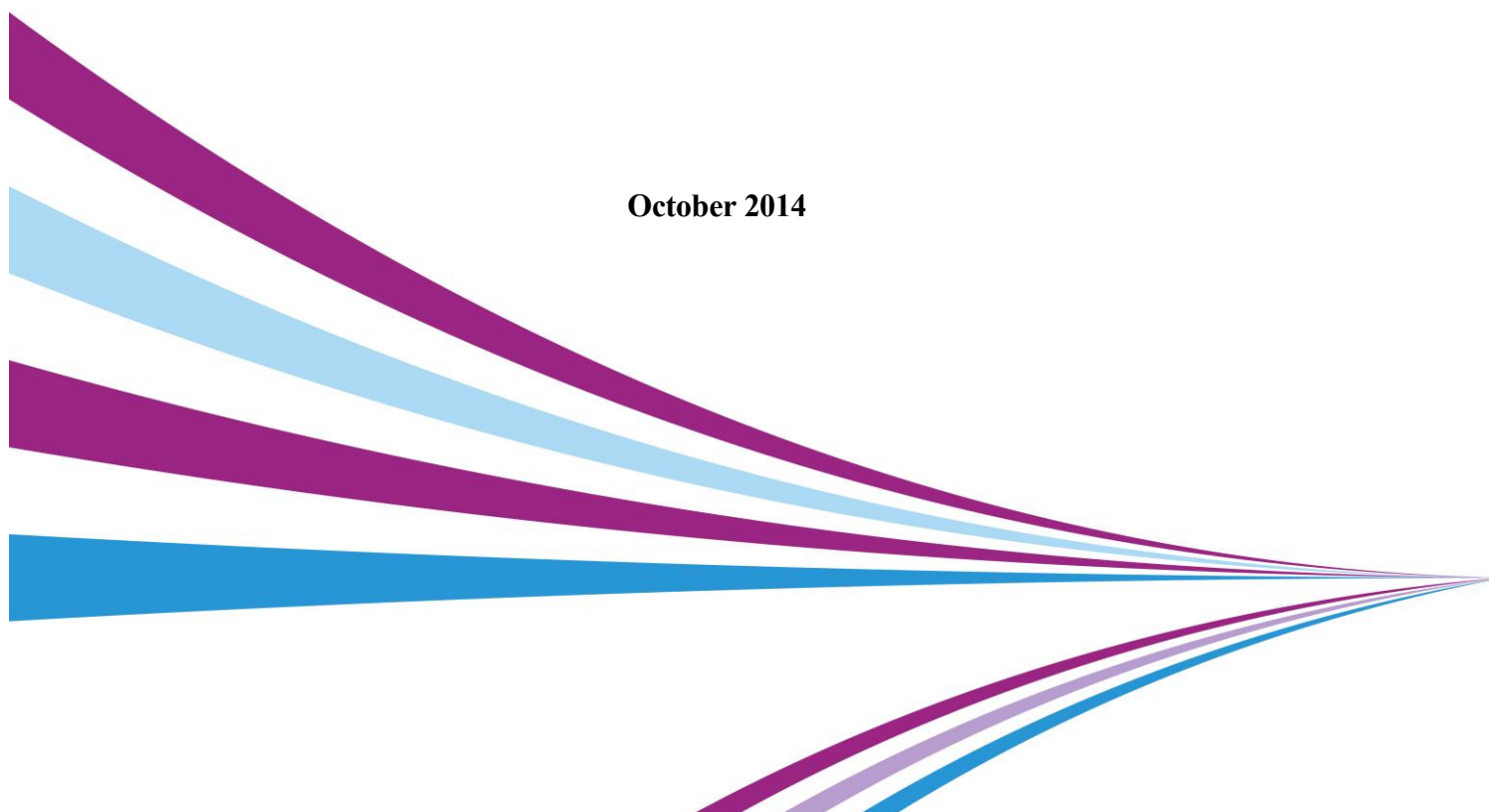


# City of Brockton Contributory Retirement System

Actuarial Valuation Report  
January 1, 2014

October 2014



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## **SECTION I - OVERVIEW**

The City of Brockton Retirement Board has engaged Buck Consultants to prepare an actuarial valuation of the Retirement System as of January 1, 2014. Employee data and asset information used in the valuation were provided by the Retirement Board.

The valuation was prepared pursuant to Chapter 32 of the Massachusetts General Laws, based upon the acceptance of Section 22D.

The purposes of the valuation are to:

- 1) analyze the current funded position of the System and determine the level of contributions necessary to assure sound funding;
- 2) update the Section 22D funding schedule currently in place for the Retirement System; and
- 3) provide reporting and disclosure information for financial statements, governmental agencies and other interested parties.

Schedule A of this report outlines the actuarial assumptions and methods used in the valuation. All assumptions are the same as those used in the previous valuation, with the exception of the annual update to mortality.

Section II provides a summary of the principal valuation results. Section V provides a projection of the Section 22D funding amounts.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, changes expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions, applicable law or regulations. An analysis of the potential range of such future differences is beyond the scope of this report.

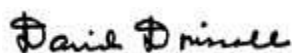
## SECTION I – OVERVIEW (CONTINUED)

This report may be used for the review of the operation of the Retirement System. The report may also be used in the preparation of audited financial statements. Use of this report for any other purpose or by anyone other than the Retirement System, the City or its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. No one may make any representations or warranties based on any statements or conclusions contained in this report without Buck Consultants' prior written consent.

This report fairly represents the actuarial position of the City of Brockton Retirement System as of January 1, 2014, in accordance with generally accepted actuarial principles applied consistently with the preceding valuation. In our opinion, the actuarial assumptions used to compute actuarial accrued liability and normal cost are reasonably related to plan experience and to reasonable expectations, and represents our best estimate of anticipated plan experience. The valuation was performed by, and under the supervision of, actuaries who have experience in performing valuations for public retirement systems. We are both Members of the American Academy of Actuaries and meet the Academy's Qualification Standards to issue this Statement of Actuarial Opinion.

Respectfully Submitted,

BUCK CONSULTANTS, LLC



10/16/2014

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David L. Driscoll, FSA, MAAA, EA  
Principal and Consulting Actuary

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Date



10/16/2014

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Hilja Viidemann, FSA, MAAA, EA  
Senior Consultant and Consulting Actuary

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Date

## SECTION II - SUMMARY OF PRINCIPAL RESULTS

1. For convenience of reference, the principal results of the valuation as of January 1, 2014 are summarized below along with a comparison with the amounts in the previous valuation as of January 1, 2013.

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Valuation Date	January 1, 2013	January 1, 2014
a) Active Members:		
Number	1,692	1,730
Annual compensation	\$ 76,378,221	\$ 73,756,821
Average age	46.9	46.5
Average service	12.0	11.6
Average compensation	\$ 45,141	\$ 42,634
b) Pensioners and beneficiaries:		
Number	1,262	1,261
Annual benefit payments	\$ 35,447,750	\$ 36,565,555
Average benefit	\$ 28,112	\$ 28,997
c) Inactive employees:		
Number	381	394
Accumulated employee contributions	\$ 2,165,365	\$ 2,078,515
d) Actuarial accrued liability	\$ 519,017,932	\$ 529,526,217
e) Market value of assets	\$ 337,599,802	\$ 363,463,353
f) Assets for valuation purposes	\$ 332,880,082	\$ 355,691,316
g) Unfunded actuarial accrued liability (d. – f.)	\$ 186,137,850	\$ 173,834,901
h) Funded percentage (f. / d.)	64.13%	67.17%
i) Section 22D funding for fiscal 2015	\$ 19,289,967	\$ 19,289,967
j) Section 22D funding for fiscal 2016	\$ 20,062,990	\$ 19,289,967

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A projection of Section 22D costs is presented in Section V. Schedule A of this report outlines the actuarial assumptions and methods employed. The provisions of the System are summarized in Schedule B. The valuation includes additional liabilities resulting from Chapter 17 COLA legislation.

### **SECTION III - MEMBERSHIP DATA**

In order to calculate the aggregate liabilities and assets on account of members of the System as of January 1, 2014, data were needed with respect to each active and retired member and beneficiary of the System. The data with respect to active, retired and terminated members and beneficiaries were furnished to the actuary by the Retirement Board.

From the data, tabulations were made showing, as of January 1, 2014, the number and annual compensation of active members classified by age and years of service and the number and annual retirement allowances of retired members and beneficiaries as of January 1, 2014, classified by age. These tables are presented in Schedule C.

The following tables show the number of active and retired members of the Retirement System as of January 1, 2014.

TABLE I  
THE NUMBER AND ANNUAL COMPENSATION  
OF ACTIVE MEMBERS  
AS OF JANUARY 1, 2014

GROUP	NUMBER	COMPENSATION
General Employees	1,386	\$ 44,827,274
Police and Fire	<u>344</u>	<u>\$ 28,929,547</u>
Total	1,730	\$ 73,756,821

TABLE II  
THE NUMBER AND ANNUAL RETIREMENT ALLOWANCES OF  
RETIRED MEMBERS AND BENEFICIARIES  
AS OF JANUARY 1, 2014

GROUP	<u>ANNUAL RETIREMENT ALLOWANCE</u>	
	NUMBER	PENSION*
Service Retirements	874	\$ 25,228,764
Disability Retirements	186	\$ 7,901,568
Beneficiaries of Deceased Members	<u>201</u>	<u>\$ 3,435,223</u>
Grand Total	1,261	\$ 36,565,555

\* Pension amounts exclude cost-of-living adjustments applied after July 1, 1981, and prior to July 1, 1998, which are funded by the Commonwealth of Massachusetts.

In addition, there are 394 members with estimated deferred benefits valued at \$2,078,515.

## SECTION IV - ASSETS

The amount of assets taken into account in this valuation is based on financial information reported by the Retirement Board. As of January 1, 2014, the reported market value of Retirement System assets amounted to \$363,463,353. The actuarial value of assets for valuation funding purposes is \$355,691,316. Valuation assets are developed using a smoothing method (described in Schedule A of this report) in order to smooth the year-to-year fluctuations due to deviations of investment returns from expected levels.

(1)	Market value of plan assets, January 1, 2013	\$337,599,802
(2)	Employer and employee contributions, net transfers and reimbursements	25,762,925
(3)	Expenses	(758,475)
(4)	Benefits and refunds	(37,619,892)
(5)	Expected interest during the year	<u>26,503,367</u>
(6)	Expected market value of plan assets, January 1, 2014	\$351,487,727
(7)	Actual market value of plan assets, January 1, 2014	363,463,353
(8)	Investment gain/(loss) during 2013 (7)-(6)	11,975,626
(9)	Investment gain/(loss) during 2012	10,770,348
(10)	Investment gain/(loss) during 2011	(27,921,277)
(11)	Investment gain/(loss) during 2010	14,489,188
(12)	Tentative Valuation Assets before reflecting 80%-120% corridor = [(7) – 80% x (8) – 60% x (9) – 40% x (10) – 20% x (11)]	\$355,691,316
(13)	80% of actual market value = 80% x (7)	290,770,683
(14)	120% of actual market value = 120% x (7)	436,156,023
(15)	Valuation Assets = (12) but not less than (13) or greater than (14)	\$355,691,316



## **SECTION V - CONTRIBUTIONS PAYABLE UNDER THE SYSTEM**

Section 22D of MGL Chapter 32 outlines various requirements of a funding schedule that will amortize the unfunded actuarial liability and cover normal costs. The normal cost and unfunded actuarial liability are to be calculated in accordance with the individual entry-age-normal actuarial cost method. The contribution toward amortization of the unfunded actuarial liability may increase by up to 4½% each year.

The following table presents a projection of contributions that satisfy the Section 22D requirements. The normal cost is assumed to increase by 4% annually while the unfunded accrued liability contribution is based on a 4½% annual increase. This schedule incorporates the funding required to provide annual COLAs under Chapter 17 of the Acts of 1997.

Please note that the amounts shown in the following schedule for the 2015 fiscal year represent the actual amounts already appropriated by the County for the 2015 fiscal year.

PENSION REFORM ACT - SECTION 22D  
FUNDING REQUIREMENTS

Fiscal Year Ending In	Normal Cost	Amortization of the Unfunded Actuarial Liability			Total City Contribution
		UAL	1992 ERI	Total Payment	
2015	5,575,912	13,641,619	72,436	13,714,055	19,289,967
2016	5,434,220	13,783,311	72,436	13,855,747	19,289,967
2017	5,596,467	14,403,560	72,436	14,475,996	20,072,463
2018	5,762,999	15,051,721	72,436	15,124,157	20,887,156
2019	5,933,899	15,729,048	72,436	15,801,484	21,735,383
2020	6,109,249	16,436,855	0	16,436,855	22,546,104
2021	6,289,135	17,176,514	0	17,176,514	23,465,649
2022	6,473,635	17,949,457	0	17,949,457	24,423,092
2023	6,662,833	18,757,183	0	18,757,183	25,420,016
2024	6,856,810	19,601,256	0	19,601,256	26,458,066
2025	7,055,643	20,483,312	0	20,483,312	27,538,955
2026	7,259,412	21,405,062	0	21,405,062	28,664,474
2027	7,468,194	22,368,290	0	22,368,290	29,836,484
2028	7,682,063	23,374,863	0	23,374,863	31,056,926
2029	7,901,094	24,426,731	0	24,426,731	32,327,825
2030	8,125,354	25,525,935	0	25,525,935	33,651,289
2031	8,354,915	26,674,601	0	26,674,601	35,029,516
2032	8,589,839	19,741,896	0	19,741,896	28,331,735
2033	8,830,189	0	0	0	8,830,189
2034	9,076,024	0	0	0	9,076,024
2035	9,327,398	0	0	0	9,327,398
2036	9,584,360	0	0	0	9,584,360
2037	9,846,954	0	0	0	9,846,954
2038	10,115,221	0	0	0	10,115,221
2039	10,389,194	0	0	0	10,389,194
2040	10,668,902	0	0	0	10,668,902
2041	10,954,363	0	0	0	10,954,363
2042	11,245,590	0	0	0	11,245,590
2043	11,695,413	0	0	0	11,695,413
2044	12,163,229	0	0	0	12,163,229
2045	12,649,758	0	0	0	12,649,758

## SECTION VI – ACCOUNTING INFORMATION

Information required under Statement No. 25 of the Governmental Accounting Standard Board (GASB) is shown below:

	<b>Normal Cost as of January 1, 2014</b>	<b>Percentage of Payroll</b>
Normal cost for the employees	\$ 6,420,391	8.70%
Normal cost for the employers	\$ 5,077,002	6.88%

### Actuarial Accrued Liability as of January 1, 2014

Total actuarial liability	
Present active members	\$ 197,628,996
Present retired members and beneficiaries	<u>331,897,221</u>
Total	\$ 529,526,217
Actuarial value of assets	<u>(355,691,316)</u>
Unfunded actuarial accrued liability	\$ 173,834,901

### Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of covered Payroll ((b-a)/c)
01/01/14	\$355,691,316	\$529,526,217	\$173,834,901	67.2%	\$73,756,821	235.7%
01/01/13	332,880,082	519,017,932	186,137,850	64.1%	76,378,221	243.7%
01/01/11	355,848,807	492,456,512	136,607,705	72.3%	74,417,105	183.6%
01/01/10	363,860,964	477,470,673	113,609,709	76.2%	75,432,689	150.6%
01/01/08	392,205,582	433,698,684	41,493,102	90.4%	74,357,273	55.8%
01/01/07	375,863,460	421,210,968	45,347,508	89.2%	72,260,162	62.8%
01/01/06	346,311,739	399,505,110	53,193,371	86.7%	69,892,659	76.1%
01/01/05	233,724,000	376,361,000	142,638,000	62.1%	69,028,000	206.6%
01/01/04	208,286,000	359,825,000	151,539,000	57.9%	67,054,000	226.0%
01/01/03	168,502,000	342,625,000	174,123,000	49.2%	65,032,000	267.7%

**SCHEDULE A - ACTUARIAL ASSUMPTIONS AND METHODS**

VALUATION INTEREST RATE: 8.00% per annum, compounded annually, net of expenses.

SEPARATIONS FROM ACTIVE SERVICE: Representative values of the assumed annual rates of withdrawal and vesting, disability, death and service retirement are as follows:

General Employees-Annual Rates of

Age	Disability	Service Retirement		Years of Service	Salary Scale	Years of Service	Rates of Withdrawal
		Male	Female				
25	.02%			0	6.00%	0	15.0%
30	.03			1	5.50	1	12.0%
35	.06			2	5.50	2	10.0%
40	.10			3	5.00	3	9.0%
45	.15			4	5.00	4	8.0%
50	.19	1.0%	1.5%	5	4.50	5	7.6%
55	.24	2.0	5.5	6	4.50	10	5.4%
60	.28	12.0	5.0	7	4.00	15	3.3%
62	.30	30.0	15.0	8	4.00	20	2.0%
65	.30	40.0	15.0	9+	3.75	25	1.0%
69		30.0	20.0			30+	0.0%

Police and Fire-Annual Rates of

Age	Disability	Service Retirements	Years of Service	Salary Scale	Years of Service	Rates of Withdrawal
25	0.20%		0	7.00%	0	1.5%
30	0.30		1	6.50	1	1.5
35	0.30		2	6.00	2	1.5
40	0.30		3	5.50	3	1.5
45	1.00	1.0%	4	5.00	4	1.5
50	1.25	2.0	5	5.00	5	1.5
55	1.20	15.0	6	4.50	6	1.5
60	0.85	20.0	7	4.50	7	1.5
62	0.75	25.0	8+	4.25	8	1.5
65	0.00	100.0			9	1.5
69					10	1.5
					11+	0.0

It is assumed that 80% of all deaths are ordinary (20% are service connected). In addition, it is assumed for the general employees that 40% of all disabilities are ordinary (60% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected). A load was applied to the accidental disability liability to account for the additional benefit payable for each dependent child upon the member's disability. Loads of approximately 2% and 11.7% were developed for Group 1 and Group 4, respectively, taking into account the higher likelihood of Group 4 accidental disabilities at younger ages, thus the likelihood of Group 4 having more dependent children than Group 1 accidental disability retirees.

**COST-OF-LIVING ADJUSTMENTS:** Retirement benefits were assumed to increase annually by 3%, up to a maximum of \$360.

**MORTALITY:** It is assumed that pre-retirement mortality is represented by the RP-2000 Mortality Table projected 15 years beyond the valuation date with Scale AA for males and females and postretirement mortality is represented by the RP-2000 Mortality Table projected 7 years beyond the valuation using Scale AA for males and females. Mortality for disabled members is represented by the RP-2000 Mortality Table set forward two years for all disabled members.

**FORM OF PAYMENT:** Future retirees are assumed to elect a Life Annuity. Future vested terminations are assumed to elect a refund of contributions.

**MARITAL PERCENTAGE:** 80% of participants are assumed to be married at death. Husbands are assumed to be 3 years older than their wives.

**LOADING OR CONTINGENCY RESERVE:** None.

**ACTUARIAL COST METHOD:** Individual entry-age normal cost method.

**ADMINISTRATIVE EXPENSES:** The normal cost is increased by an amount equal to the anticipated administrative expenses for the upcoming fiscal year. The amount for plan year 2014 is \$680,000 and is anticipated to increase at 4.0% per year.

**ASSET VALUATION METHOD:** For contribution basis, assets are valued according to the following general formula, provided such value is within a 20% corridor of the market value:

$$VA = MV - .8I_1 - .6I_2 - .4I_3 - .2I_4 \text{ where}$$

$$VA = \text{Valuation assets.}$$

$$MV = \text{Market value of assets as of the valuation date.}$$

$$I_n = \text{Investment gain (loss) during } n^{\text{th}} \text{ year preceding the valuation date.}$$

## **SCHEDULE B - SUMMARY OF SYSTEM PROVISIONS**

### **MEMBERSHIP**

The Retirement System covers all employees of participating units except teachers, elected officials and those employees in service at the time of its establishment who elected not to become members. Eligible employees in the City who enter service on or after the date the System became operative for their classification may become members of the Retirement System on their own application.

### **SUMMARY OF BENEFIT AND CONTRIBUTION PROVISIONS**

A summary of the main benefit and contribution provisions of the Retirement System, as interpreted for the valuation, is presented below.

The terms “Group 1” and “Group 4” are used to denote “general employees” and “police and fire”, respectively.

### **BENEFITS**

Final Average Salary (FAS)	For those hired prior to April 2, 2012, the average of a member’s three highest consecutive years’ compensation. For those hired on or after April 2, 2012, the average of a member’s five highest consecutive years’ compensation. For those hired on or after January 1, 2011, salary taken into account for benefit purposes is capped at 64% of the IRC Section 401(a)(17) limit (indexed).
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#### **Superannuation Retirement**

Eligibility	For those hired prior to April 2, 2012: Age 65 for Group 1; Age 55 for Group 4. Maximum retirement age is 70 for Group 1 and 65 for Group 4.  For those hired on or after April 2, 2012: Age 67 for Group1; Age 57 for Group 4 if member has completed 30 years of service, or age 62 otherwise.
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Allowance	2.5% per year of service times FAS. Maximum total allowance is 80% of FAS. Veterans receive additional \$15 annually per year of service to a maximum of \$300 annually.
Early Retirement	
Eligibility	20 years of service, or age 55 with 10 years of service. Group 1 members hired after April 1, 2012 are eligible upon the attainment of age 60 and 10 years of service.
Allowance	<p>Calculated as a superannuation retirement allowance (including veteran's benefits) except accrual rate is equal to 2.5% reduced by .1% for each year age at retirement is below either 65 for Group 1 or 55 for Group 4. If hired after April 1, 2012, the accrual rate of 2.5% is reduced by .15% for each year age at retirement precedes age 67 for Group 1 or age 57 for Group 4 (age 62 if service at retirement is less than 30 years).</p> <p>The minimum allowance after 30 years of service is equal to:</p> <ol style="list-style-type: none"> <li>(1) An annuity which is the actuarial equivalent of member's accumulated deductions; and</li> <li>(2) A pension equal to 1/3 of FAS and any veteran's benefits as described under superannuation retirement.</li> </ol>
Vested Retirement	
Eligibility	10 years of service. For certain involuntary terminations, this is reduced to 6 years.
Allowance	<p>A superannuation retirement allowance commencing at age 55 for Group 1 members (age 60 if hired after April 1, 2012) and age 45 for Group 4 members (age 55 if hired after April 1, 2012) or later, where the accrual rate is determined by the age of the member at the time the allowance commences.</p> <p>In lieu of the deferred pension benefit, a member may elect to receive a refund of their accumulated contributions. Members with ten or more years of service are entitled to 100% of the credited interest on their contributions. Members with five to ten years of service are entitled to 50% of the credited interest on their contributions. No credited interest is provided for members with less than five years of service.</p>

## Ordinary Disability

Eligibility	10 years of service
Allowance	<p>An immediate allowance equal to the age 55 rate for Group 1 members or age 45 rate for Group 4 members per year of service times FAS.</p> <p>Veterans receive an allowance equal to:</p> <ol style="list-style-type: none"><li>(1) An annuity which is the actuarial equivalent of their accumulated deductions; and</li><li>(2) A pension which is the greater of 50% of current salary and the service retirement allowance to which they are eligible, if any.</li></ol>

## Accidental Disability

Eligibility	Permanent incapacity for further duty as a result of personal injury sustained while in the performance of duties.
Allowance	<p>An immediate allowance equal to:</p> <ol style="list-style-type: none"><li>(1) An annuity which is the actuarial equivalent of the member's accumulated deductions; and</li><li>(2) A pension equal to 72% of current salary; and</li><li>(3) A supplement equal to \$797.64 per year per child under 21.</li></ol> <p>The maximum total allowance is 100% of current salary.</p>

## Accidental Death Benefit

Eligibility	Death due to an occupational injury.
Allowance	<p>An immediate allowance equal to:</p> <ol style="list-style-type: none"><li>(1) A lump sum payment equal to the accumulated deductions at death; and</li><li>(2) A pension equal to 72% of current salary and payable to the surviving spouse, dependent children, or the dependent parents; and</li></ol>



- (3) A supplement of \$312 per year per child payable to the spouse or legal guardian until all children reach age 21, unless handicapped.

The maximum total allowance is 100% of current salary.

## Death in Active Service

### Eligibility

Death of a member due to a non-occupational injury.

### Allowance

An immediate allowance that would have been payable had the member retired and elected the 2/3 joint and survivor option on the day before his death. For death occurring prior to the minimum superannuation retirement age, the age 55 (age 60 if hired after April 1, 2012) and age 45 (age 55 if hired after April 1, 2012) accrual rates are used, respectively, for Group 1 and Group 4 members.

For members with at least 2 years of service at death, the surviving spouse receives an additional allowance equal to the sum of \$1,440 per year for the first child and \$1,080 per year for each additional child.

The maximum total allowance is 100% of salary at the date of death.

## Normal Form of Benefit

Reduced modified cash refund annuity.

## Optional Forms of Benefit

- (1) Life annuity.
- (2) Modified cash refund annuity.
- (3) 66-2/3% joint and survivor allowance.

## Return of Contribution

If no other benefit is payable upon termination, the member's accumulated deductions are returned.

## Post-Retirement Adjustments

Up to 3% of the annual retirement allowance up to a maximum of \$360 annually.

## Member Contributions

Members contribute a percentage of annual regular compensation in accordance with their respective dates of hire, as shown below:

<u>Date of Hire</u>	<u>Rate of Contribution</u>
Prior to January 1, 1975	5%
On or after January 1, 1975	7%
On or after January 1, 1984	8%
On or after July 1, 1996	9%

Members hired on or after January 1, 1979 contribute an additional 2% of compensation in excess of \$30,000.

The contribution rate for Group 1 participants hired on or after April 2, 2012 and who attain 30 years of service is reduced by three percentage points.

**SCHEDULE C**

**MEMBERSHIP TABLES**

**TABLE 1****AGE/SERVICE DISTRIBUTION WITH SALARY AS OF JANUARY 1, 2014**

Attained Age	Average Salary	<5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40+	Total
20-24	63	1									64
	14,564	23,429									14,703
25-29	117	23									140
	17,599	31,628									19,903
30-34	84	45	7								136
	23,936	49,615	47,749								33,659
35-39	61	41	49	17							168
	23,591	59,088	66,313	72,192							49,632
40-44	68	47	59	76	7	1					258
	21,137	37,885	67,154	75,831	67,468	51,732					52,198
45-49	41	51	53	71	15	9	1				241
	24,134	30,684	40,685	64,411	80,554	81,612	131,790				47,131
50-54	43	41	48	44	19	37	7				239
	21,864	28,301	40,745	47,657	66,749	86,049	122,692				47,967
55-59	24	32	57	73	19	22	12	10	1		250
	21,856	37,243	40,868	39,998	44,647	71,350	82,772	90,036	56,482		45,335
60-64	14	19	24	41	16	29	8	8	4		163
	22,192	29,186	27,291	37,296	42,947	43,320	78,716	64,602	89,727		39,866
65-69	4	6	10	10	7	7	2	2	5		53
	22,014	21,484	34,711	37,793	43,952	56,161	93,391	44,342	57,907		41,656
70+		2	6	2		2	2	2	2		18
		18,961	36,725	24,880		75,521	74,161	23,345	65,007		43,561
Total Employees	519	308	313	334	83	107	32	22	12		1,730
Average Salary	20,649	38,393	48,593	55,501	57,734	68,600	92,148	70,570	69,578		42,634

**TABLE 2**

**THE NUMBER AND ANNUAL PENSIONS OF RETIRED MEMBERS  
DISTRIBUTED BY AGE AS OF JANUARY 1, 2014**

Age	Service Retirements		Disability Retirements		Beneficiaries	
	Number	Annual Pension	Number	Annual Pension	Number	Annual Pension
Under 20	0	0	0	0	1	260
20 - 24	0	0	0	0	0	0
25 - 29	0	0	0	0	0	0
30 - 34	0	0	0	0	0	0
35 - 39	0	0	2	38,078	1	21,432
40 - 44	0	0	7	300,996	1	28,700
45 - 49	0	0	10	565,001	1	6,180
50 - 54	5	131,591	9	388,562	3	58,529
55 - 59	24	952,911	15	577,031	7	127,680
60 - 64	110	4,693,948	27	1,222,569	12	256,312
65 - 69	191	6,913,167	43	2,008,388	26	560,638
70 - 74	171	5,297,263	33	1,351,778	24	472,968
75 - 79	134	3,439,973	17	677,548	25	420,425
80 - 84	113	2,128,037	14	483,639	35	562,346
85 - 89	79	1,136,886	7	204,138	42	590,691
90 - 94	41	488,266	2	83,840	18	228,376
95 - 99	6	46,722	0	0	4	85,502
100 and over	0	0	0	0	1	15,183
<b>Total</b>	<b>874</b>	<b>25,228,764</b>	<b>186</b>	<b>7,901,568</b>	<b>201</b>	<b>3,435,223</b>

**SCHEDULE D**  
**VALUATION RESULTS BY GROUP**

## Breakouts

	<u>Total</u>	<u>All Others/City of Brockton</u>	<u>Brockton Redevelopment Authority</u>	<u>Brockton Housing Authority</u>	<u>Brockton Area Transit</u>
(1) Participants					
(a) Actives	1,730	1,655	6	64	5
(b) Retirees and Beneficiaries	1,075	1,027	4	44	0
(c) Vested	0	0	0	0	0
(d) Inactive (Refund)	394	389	1	3	1
(e) Disabled Retirees	<u>186</u>	<u>183</u>	<u>1</u>	<u>2</u>	<u>0</u>
(f) Total	3,385	3,254	12	113	6
(2) Payroll of Active Participants	73,756,821	69,675,322	356,475	3,363,153	361,871
Percent of Total Payroll	100.00%	94.47%	0.48%	4.56%	0.49%
(3) Normal Cost					
(a) Total Normal Cost	10,817,393	10,338,921	72,869	375,181	30,422
(b) Expected Employee Contributions	6,420,391	6,078,086	32,296	280,962	29,047
(c) Administrative Expenses	<u>680,000</u>	<u>649,922</u>	<u>4,581</u>	<u>23,585</u>	<u>1,912</u>
(d) Net Employer Normal Cost (a) - (b) + (c)	5,077,002	4,910,757	45,154	117,804	3,287
(4) Actuarial Accrued Liability	529,526,217	505,848,624	1,251,926	20,908,626	1,517,041
(5) Assets*	<u>355,691,316</u>	<u>345,817,232</u>	<u>499,787</u>	<u>8,347,025</u>	<u>1,027,272</u>
(6) Unfunded Actuarial Accrued Liability (4) - (5)	173,834,901	160,031,392	752,139	12,561,601	489,769
(7) Amortization of unfunded accrued liability	13,142,460	12,098,872	56,864	949,696	37,028
(8) ERI	69,701	0	0	69,701	0
(9) Total Required Employer Contributions (3d) + (7) + (8)	18,289,163	17,009,629	102,018	1,137,201	40,315
(10) Fiscal 2015 Cost	19,289,967	18,037,764	102,688	1,100,962	48,553
(11) Fiscal 2015 Cost - Assuming late payment for Housing	19,334,005	18,037,764	102,688	1,145,000	48,553
(12) Percentage of total	100.00%	93.51%	0.53%	5.71%	0.25%
2016 Normal Cost	5,229,081	5,057,856	46,507	121,333	3,385
2016 ERI	69,702	0	0	69,702	0
2016 Amortization of unfunded accrued liability	13,261,691	12,208,635	57,380	958,312	37,364
(13) Fiscal 2016 Cost	19,289,967	17,945,220	107,963	1,194,436	42,348
(14) Fiscal 2016 Cost - Assuming late payment for Housing	19,337,744	17,945,220	107,963	1,242,213	42,348
(15) Percentage of total	100.00%	93.03%	0.56%	6.19%	0.22%

\* Allocation of assets based on the ratio of the Actuarial Accrued Liability, adjusted by a credit of \$143,875,163 for the City of Brockton and the 1/1/2008 transfer of assets for the BAT of \$264,995. See page 22 for more detail on this allocation.

### Allocation of Assets for Breakouts Exhibit

(1)	City of Brockton Credit	
(a)	Bond issued 12/1/2005	\$100,000,000
(b)	2005 contribution shortfall	(3,143,836)
(c)	Credit as of 1/1/2006 (one month of interest at 6.67%)	97,394,772
(d)	Credit as of 1/1/2007 (interest at 12.55%)	109,617,816
(e)	Credit as of 1/1/2008 (interest at 7.01%)	117,302,025
(f)	Credit as of 1/1/2009 (interest at -29.26%)	82,979,452
(g)	Credit as of 1/1/2010 (interest at 23.60%)	102,562,603
(h)	Credit as of 1/1/2011 (interest at 13.46%)	116,367,529
(i)	Credit as of 1/1/2012 (interest at 0.10%)	116,483,897
(j)	Credit as of 1/1/2013 (interest at 12.27%)	130,776,471
(k)	Credit as of 1/1/2014 (interest at 12.42%)	147,018,909
(l)	Total Brockton Market Value of Assets as of 1/1/2014	363,463,353
(m)	Total Brockton Actuarial Value of Assets as of 1/1/2014	355,691,316
(n)	Actuarial Value of Assets allocated to City of Brockton Credit (k) x (m) / (l)	143,875,163
(2)	BAT Actuarial Value of Assets	
(a)	BAT Market Value of Assets as of 1/1/2008	\$264,995
(b)	End of year employer contribution	40,000
(c)	Mid-year employee contributions	28,609
(d)	Interest at -29.26%	(82,084)
(e)	BAT Market Value of Assets as of 1/1/2009	251,520
(f)	End of year employer contribution	83,217
(g)	Mid-year employee contributions	32,105
(h)	Interest at 23.60%	62,947
(i)	BAT Market Value of Assets as of 1/1/2010	429,788
(j)	End of year employer contribution	83,384
(k)	Mid-year employee contributions	33,785
(l)	Interest at 13.46%	60,051
(m)	BAT Market Value of Assets as of 1/1/2011	607,009
(n)	End of year employer contribution	50,758
(o)	Mid-year employee contributions	33,332
(p)	Interest at 0.10%	624
(q)	BAT Market Value of Assets as of 1/1/2012	691,723
(r)	End of year employer contribution	53,411
(s)	Mid-year employee contributions	33,857
(t)	Interest at 12.27%	86,891
(u)	BAT Market Value of Assets as of 1/1/2013	865,882
(v)	End of year employer contribution	48,553
(w)	Mid-year employee contributions	26,164
(x)	Interest at 12.42%	109,120
(y)	BAT Market Value of Assets as of 1/1/2014	1,049,719
(z)	BAT Actuarial Value of Assets as of 1/1/2014 (y) x (1m) / (1l)	<b>1,027,272</b>
(3)	Actuarial Value of Assets remaining after City of Brockton Credit and BAT are	
(a)	Total Brockton Actuarial Value of Assets as of 1/1/2014	\$355,691,316
(b)	City of Brockton Credit (1n)	143,875,163
(c)	Actuarial Value of Assets allocated to BAT (2z)	<u>1,027,272</u>
(d)	Remaining AVA (a) - (b) - (c)	210,788,881
(4)	BRA Actuarial Value of Assets	
(a)	BRA Accrued Liability as of 1/1/2014	\$1,251,926
(b)	Total non-BAT Accrued Liability as of 1/1/2014	528,009,176
(c)	BRA Actuarial Value of Assets (3d) x (a) / (b)	<b>499,787</b>
(5)	BHA Actuarial Value of Assets	
(a)	BHA Accrued Liability as of 1/1/2014	\$20,908,626
(b)	Total non-BAT Accrued Liability as of 1/1/2014	528,009,176
(c)	BHA Actuarial Value of Assets (3d) x (a) / (b)	<b>8,347,025</b>



**Allocation of Assets for Breakouts Exhibit**

(6) City of Brockton Actuarial Value of Assets	
(a) Total Actuarial Value of Assets as of 1/1/2014	\$355,691,316
(b) BAT Actuarial Value of Assets as of 1/1/2014 (2z)	1,027,272
(c) BRA Actuarial Value of Assets as of 1/1/2014 (4c)	499,787
(d) BHA Actuarial Value of Assets as of 1/1/2014 (5c)	8,347,025
(e) City of Brockton Actuarial Value of Assets as of 1/1/2014 (a) - (b) - (c) - (d)	<b>345,817,232</b>

**SCHEDULE E****PROJECTION OF EXPECTED PENSION PAYMENTS**

YEAR	AMOUNT	YEAR	AMOUNT
2014	\$41,005,104	2039	\$61,117,418
2015	40,054,408	2040	60,499,243
2016	41,007,635	2041	59,707,083
2017	42,050,542	2042	58,688,938
2018	43,239,396	2043	57,499,234
2019	44,434,228	2044	56,181,946
2020	45,630,301	2045	54,618,230
2021	46,848,821	2046	52,960,703
2022	48,026,973	2047	51,150,486
2023	49,206,792	2048	49,217,862
2024	50,531,643	2049	47,325,227
2025	51,805,218	2050	45,291,326
2026	53,156,478	2051	43,211,903
2027	54,402,049	2052	41,102,038
2028	55,631,291	2053	38,933,358
2029	56,697,430	2054	36,754,914
2030	57,733,237	2055	34,532,617
2031	58,726,542	2056	32,294,541
2032	59,596,197	2057	30,073,583
2033	60,267,632	2058	27,867,935
2034	60,801,284	2059	25,697,910
2035	61,428,596	2060	23,583,416
2036	61,688,471	2061	21,529,808
2037	61,750,767	2062	19,548,913
2038	61,563,442	2063	17,656,181

**SCHEDULE F****GASB 27****DEVELOPMENT OF PENSION COST AND NET PENSION OBLIGATION (NPO)**

GASB Statement No. 27 requires the development of Annual Pension Cost and Net Pension Obligation (NPO). This development is shown in the following table.

Fiscal Year Ending	Annual Required Contribution	Interest on NPO	Amortization of NPO	Pension Cost (1)+(2)-(3)	Actual Contribution	Change in NPO (4)-(5)	NPO Balance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Brockton Redevelopment Authority</b>							
2012	44,718	777	704	44,791	44,718	73	9,785
2013	68,618	783	739	68,662	68,618	44	9,829
2014	70,679	786	777	70,688	70,679	9	9,838
<b>Brockton Housing Authority</b>							
2012	972,831	8,839	8,005	973,665	1,011,745	(38,080)	72,413
2013	1,069,114	5,793	5,473	1,069,434	1,111,879	(42,445)	29,968
2014	1,110,184	2,397	2,371	1,110,210	1,154,591	(44,381)	(14,413)
<b>Brockton Area Transit</b>							
2012	83,384	(772)	(699)	83,311	83,384	(73)	(9,721)
2013	50,758	(778)	(735)	50,715	50,758	(43)	(9,764)
2014	53,411	(781)	(772)	53,402	53,411	(9)	(9,773)
<b>All Others/City of Brockton</b>							
2012	12,686,871	(6,923,708)	(6,269,959)	12,033,122	12,694,083	(660,961)	(87,207,315)
2013	15,408,092	(6,976,585)	(6,590,560)	15,022,067	15,408,092	(386,025)	(87,593,340)
2014	16,004,607	(7,007,467)	(6,928,841)	15,925,981	16,004,607	(78,626)	(87,671,966)
<b>Total</b>							
2012	13,787,804	(6,914,864)	(6,261,949)	13,134,889	13,833,930	(699,041)	(87,134,837)
2013	16,596,582	(6,970,787)	(6,585,083)	16,210,878	16,639,347	(428,469)	(87,563,306)
2014	17,238,881	(7,005,065)	(6,926,465)	17,160,281	17,283,288	(123,007)	(87,686,313)